

From this it is seen that the excess of temperature was least at the extreme western stations, the mean at Valencia only exceeding the average for 15 years by $0^{\circ}4$, whilst the night temperature was even below the average. In nearly every case it is seen that the excess of the day temperatures over the average was larger than that of the night temperatures. A feature of especial interest in the table is the large number of days on which the temperature reached 50° or above.

It is interesting to notice the very great difference between the temperature in January this year, in comparison with that which occurred in January 1881, when the weather was exceptionally cold. At Loughborough, the mean temperature this year exceeded that in 1881 by 17° , which is 4° in excess of the difference between the average temperature for January and May; there were also several stations in nearly all parts of the Kingdom with an excess of 12° and 13° .

At Greenwich Observatory the mean temperature obtained from the mean of the maximum and minimum readings was $43^{\circ}4$; and with the exception of $43^{\circ}5$ in 1884 and $43^{\circ}6$ in 1846, this has not been exceeded in January during the last half-century. The mean of the highest day temperatures was $48^{\circ}5$, which is higher than any January during the last fifty years, and the only other instances of 48° , or above, were $48^{\circ}1$ in 1877 and 1851, and $48^{\circ}0$ in 1846. There were six years with the mean maximum between 47° and 48° , but only eighteen in all above 45° , whilst in January 1879 the mean of the maxima was only $35^{\circ}1$, or $13^{\circ}4$ colder than this year, and in 1881 it was only $36^{\circ}2$. There have been three Januaries during the last half-century with a higher mean night temperature, but in no year was the excess more than 1° . In January this year the mean minimum was $38^{\circ}2$, and in 1884 it was $39^{\circ}2$. The Greenwich observations also show that there were in January 17 days with a temperature of 50° or above, whereas in the corresponding period during the last 50 years there has been no similarly high number of days with this temperature. It was reached 14 times in 1877, 1853, and 1846; 13 times in 1873 and 1849; 12 times in 1884; 11 times in 1874, 1869, 1852, and 1851; and in 28 Januaries 50° or above was only attained 5 times or less.

The warm weather was very intimately connected with the heavy wind storms which occurred throughout the month, the storm systems which so frequently arrived on our coasts from off the Atlantic being the natural carriers of warm moist air. Scarcely a day passed during the month without the arrival of some fresh disturbance from the westward, but with one or two exceptions the central areas of the storm systems skirted the western and northern coasts and did not pass directly over our islands. The disturbances, however, passed sufficiently near to us to cause winds of gale force, and there was scarcely a day throughout the month that a gale was not blowing in some part of the United Kingdom. In the North Atlantic the month was exceptionally stormy, and vessels trading between Europe and America experienced unusually heavy weather.

The month was also marked by the prevalence of influenza, and, in addition to this, a general unhealthiness pervaded all classes of the community. The death-rate, from all causes, in London, for the four weeks ending January 25, corresponded to an annual rate of 29.7 per 1000 of the total population, which is excessively high. The rates for the corresponding period in the last four years were 21.7 in 1889, 23.2 in 1888, 22.7 in 1887, and 22.6 in 1886.

CHAS. HARDING.

NOTES.

THE subject of the Bakerian Lecture, which, as we announced last week, is to be delivered by Prof. Schuster on March 20, will be "The Discharge of Electricity through Gases."

THE Academy of Sciences of Berlin has presented the following sums of money: £90 to Dr. Rohde, of Breslau, for a journey to Naples to continue his observations on the central nervous system of sharks and echinoderms at Prof. Dohrn's zoological station; £80 to Prof. Matthiessen, of Rostock, to further his researches on the eyes of whales at the stations of the North Sea fisheries; £25 to Prof. Dr. Winkler, of Breslau, for a journey to St. Petersburg to make researches on the Turkish, Samoyed, and Tungusian languages; £30 to Dr. Schellong, the New Guinea traveller, to publish the results of his anthropological studies.

It is proposed that the following address shall be presented to Prof. Stuart on the occasion of his resignation of his Professorship at Cambridge:—"We, the undersigned resident members of the Senate, having learned from your letter to the Vice-Chancellor your intention of resigning your Professorship in the University, desire to express our sense of the great public service which you have rendered in connection with the University Extension movement. By yourself first delivering specimen courses of lectures, and afterwards strenuously advocating and ably organizing their wide-spread establishment, you did for the country at large, and for our own and other Universities, work which we regard with sincere respect and admiration. The degree in which Cambridge has, during the last twenty years, come into useful relations with sections of the community which were previously regarded as beyond the sphere of its influence is, we hold, largely attributable to your inspiring initiative, and to the wise principles of administration which, mainly under your guidance, the University laid down."

AMONG the lectures to be delivered at the Royal Institution of Great Britain after Easter we note the following:—On Tuesdays, April 15, 22, 29, three lectures on the place of Oxford University in English history, by the Hon. George C. Brodrick; on Tuesdays, May 27, June 3, 10, three lectures on the natural history of society, by Mr. Andrew Lang; on Thursdays, April 17, 24, May 1, three lectures on the heat of the moon and stars (the Tyndall Lectures), by Mr. C. V. Boys, F.R.S.; on Thursdays, May 8, 15, 22, 29, June 5, 12, six lectures on flame and explosives, by Prof. Dewar, F.R.S.; on Saturdays, April 19, 26, May 3, three lectures on colour and its chemical action, by Captain W. de W. Abney, F.R.S.

THE De Candolle Prize has been awarded to Prof. F. Buchenau, of Bremen, for his monograph of the Juncagineæ.

A CONGRESS for Viticulture will be held in Rome from the 23rd to the 27th of the present month. The principal object of the Congress will be the discussion of remedies for the *Peronospora viticola* and other diseases of the vine caused by vegetable parasites. There will be an International Exhibition of apparatus for the cure of these diseases, and numerous prizes will be awarded.

THE annual general meeting of the members of the German Botanical Society is to be held this year in Bremen late in September.

APPENDIX I. of the *Kew Bulletin*, just issued, contains a list of such hardy herbaceous annual and perennial plants and of such trees and shrubs as matured seeds under cultivation in the Royal Gardens, Kew, during the year 1889. It is explained that these seeds are available for exchange with Colonial, Indian, and Foreign Botanic Gardens, as well as with regular correspondents of Kew. The seeds are for the most part only available in moderate quantity, and are not sold to the general public.

THE Nachtigal Gesellschaft of Berlin, for German research in Africa, has just completed its second year of business. It was announced at the last general meeting that the list of members

had been doubled during the last year. The Society's library contains 200 books on Africa. Herr Schiller-Tietz was elected President of the Society in place of Councillor Engelke.

A CURIOUS phenomenon is reported from Batoum. On January 23, at 4 p.m., during a complete calm, the sea is said to have suddenly receded from the shore, leaving it bare to a depth of ten fathoms. The water of the port rushed out to sea, tearing many of the ships from their anchorage, and causing a great amount of damage. After a short time the sea assumed its usual level.

AN important addition to our knowledge of the meteorology of Central America has been made by the publication of Parts 1-4 of the *Boletín trimestral* of the National Meteorological Institute of San José, Costa Rica, for the year 1888, under the direction of Prof. E. Pittier. The Observatory is situated in latitude $9^{\circ} 56' N.$, longitude $84^{\circ} 8' W.$, and its importance may be judged from the fact that no other station of the first order possessing self-recording instruments is to be found between Mexico, in latitude $19^{\circ} N.$, and Rio de Janeiro, in latitude $23^{\circ} S.$ The bulletin contains observations made several times daily, and hourly observations of rainfall for five months, also a summary of the observations formerly made in Costa Rica. The older series of observations show that the mean yearly extremes of temperature at San José were $78^{\circ} 8'$ and $56^{\circ} 7'$, while the mean difference of the monthly means amounted only to about 4° . The daily period of rainfall is very marked. From sunrise to noon scarcely any rain falls, while between noon and 6h. p.m. about 75 per cent. of the whole amount falls. The mean duration of rain on a wet day is 2h. 9m. Only two months of anemometrical observations are given; these show that the maximum velocity at noon is twice as great as the mean velocity during the night. An interesting summary of the observations has been published by Dr. Hann in the *Meteorologische Zeitschrift* for February.

AT a recent meeting of the Paris Geographical Society an interesting lecture was delivered by Dr. Hamy, on the history of scientific missions in France under the old monarchy. He commenced practically with the reign of Francis I., and described many missions abroad, with purely scientific aims, which are now either forgotten, or the results of which have never been published. Thus, the apothecary to Henri IV. went all over the globe in search of the peculiar products of each country, especially medicinal and food plants; still earlier, another explorer went to Brazil to study dyeing woods; and, in the last century, Condamine, Dombey, Bougainville, and La Pérouse went on their well-known expeditions. The President, Comte de Bisemont, mentioned that there were still in the archives of the Ministry of Marine copies of the instructions given to travellers and navigators in past centuries, and that these were "positively models of their kind, which could not be followed too closely now." Prof. Bureau, of the Museum of Natural History in Paris, observed that a botanical collection made by Paul Lucas in the reign of Louis XIV. still existed in the Museum, and he referred especially to Tournefort, of the same period, whom he described as the scientific traveller of former times who perhaps most nearly approached moderns in his methods of observation. He was sent by the King on a botanical expedition to the Levant, with very precise instructions, amongst others, to collect and observe the plants mentioned by the ancients. He did not confine himself to this, but formed a complete herbarium, which is still preserved at the Museum, and is one of its treasures. He was accompanied by an artist named Aubriet, who brought back a large collection of coloured sketches, which forms an important part of the unrivalled collection in the library of the Museum.

A NEW and very simple method of measuring small elongations of a bar under any influence has been devised by Signor Cardani (*Cosmos*). To one end of the bar is attached a metallic

wire stretched so as to give a determinate number of vibrations. When the bar expands, the wire becomes less tense, and gives fewer vibrations, and there is a simple relation between the number of vibrations and the elongation of the bar. The author cites a case in which a variation of one hundredth of a millimetre in a bar lessens the double vibrations from 99 to 96.5. Now, a practised ear will appreciate a difference of one vibration per cent.; hence it suffices to ascertain variations of length less than 0.01 millimetre. With other methods of measuring change of vibration, elongations of thousandths of a millimetre may be ascertained.

THE first careful determination of latitude in Tokio (according to the *Japan Weekly Mail*) was made in 1876 by Captain Kimotsuki, at that time Director of the Naval Observatory. In 1888, soon after the transfer of the Naval Observatory to the Imperial University, and its reorganization as the Astronomical Observatory of Tokio, the new Director, Prof. Terao, resolved upon a redetermination of the latitude. The work was entrusted to Mr. Watanabe, a skilled observer, and the result has been published as the first of the "*Annales de l'Observatoire Astronomique de Tokio* (Université Impériale du Japon, Collège des Sciences)." The determination was made in two distinct ways: first, by observations of the upper and lower transits of the Pole star across the meridian; second, by observations of the zenith distances of 38 different stars, arranged in couples according to Talcott's method. This latter method only was used by Captain Kimotsuki in this earlier determination. The earlier mean value for the latitude was $35^{\circ} 39' 17''.492$; while the recently obtained mean values were $35^{\circ} 39' 15''.05$ by the first method, and $35^{\circ} 39' 15''.41$ by the second method. This discrepancy of fully $2''$ is, in the circumstances, too large to be regarded as an accidental error, and must be due to some systematic error in either the earlier or the later determination. More weight will be attached to the new determination, since Mr. Watanabe had much superior instruments at his disposal.

THE stay of some 306 natives from various French colonies, &c., for about six months, in Paris last year, in connection with the Exhibition, was an interesting experiment in acclimatization. Owing to wise hygienic measures (such as vaccination, good water-supply, isolation of closets, and surveillance of food), these Annamites, Tonquinese, Senegalese, &c., seem to have escaped most of the common endemic disease. According to the *Semaine Médicale*, they had no typhoid fever, scarlatina, or measles, though these were in Paris at the time. Some 68 natives were attacked by mumps. The fatigues of a voyage and the change of climate led to a recurrence of intermittent fever, with grave symptoms, in twenty cases. It was thought at first to be typhoid fever of a severe type; but the rapid and durable efficacy of sulphate of quinine, given in doses of 2 to 3 grammes a day, proved the paludine nature of the disorder. It is noteworthy that most illnesses of this population, especially that just noticed, and those from cold, appeared during the first part of the time, when the weather was mild; while in the second period, with unfavourable atmospheric conditions, the illness diminished, whether owing to precautions in the matter of dress and food, or to more complete acclimatization. The negroes of Senegal and the Gaboon seem to have been the greatest sufferers, while the Indo-Chinese race acclimatized the best.

THE first *Bulletin* issued this year by the Académie Royale de Belgique contains a note by M. Van Beneden, on a Ziphius which was stranded in the Mediterranean, and a list of the prize subjects for 1891. The subjects dealt with are architecture, engraving, painting, and music. Four gold medals are given, having values 1000, two 800, and 600 francs respectively. The dissertations may be written in French, Flemish, or Latin, and must be sent before June 1, 1891, to M. J. Liagre, Secretary of the Academy.

A SHORT note on diethylene diamine, $C_2H_4 \begin{smallmatrix} \diagup NH \\ \diagdown NH \end{smallmatrix} C_2H_4$, is contributed to the new number of the *Berichte* of the German Chemical Society by Dr. J. Sieber, of Breslau. It was obtained by the action of ethylene dibromide, $C_2H_4Br_2$, upon ethylene diamine, $C_2H_4 \begin{smallmatrix} \diagup NH_2 \\ \diagdown NH_2 \end{smallmatrix}$, a liquid boiling at $123^\circ C$. Upon treating the product of this reaction with caustic potash, an oily liquid separated, consisting of a mixture of bases. The separated liquid was next dehydrated as completely as possible, and then submitted to fractional distillation, when the portion boiling between 168° – 175° was found to consist of diethylene diamine admixed with a little water. The affinity of the base for water is, in fact, so great that it was found impossible to remove the last traces of moisture. Diethylene diamine, however, readily forms salts which can be isolated in a state of purity, and the analyses of which prove the composition of the base itself. The hydrochloride, $C_2H_4 \begin{smallmatrix} \diagup NH.HCl \\ \diagdown NH.HCl \end{smallmatrix} C_2H_4$, crystallizes in beautiful white needles, very soluble in water, but insoluble in alcohol. The platinichloride, $C_4H_{10}N_2(HCl)_2PtCl_4$, forms fine yellow needle-shaped crystals, readily soluble in hot water, but difficultly soluble in boiling alcohol. A very beautiful salt is also formed with mercuric chloride, $C_4H_{10}N_2(HCl)_2HgCl_2$, consisting of star-like aggregates of acicular crystals, also soluble in hot water, but reprecipitated by the addition of alcohol.

DRS. WILL AND PINNOW communicate to the same journal their report upon the analysis of the remarkable meteorite of Carcote, Western Cordilleras, Chili. The great mass of this meteorite, 80 per cent., is found to consist of two silicates. One of them is readily decomposed by hydrochloric acid, and possesses the composition and optical characters of olivine, $(MgFe)_2SiO_4$. The other is unattacked by hydrochloric acid, and exhibits the chemical and crystallographical characters of a member of the diopside group. Interspersed among the silicates are smaller quantities of chrome ironstone, bronze-like sulphide of iron, probably troilite, and light steel-grey nickelliferous iron. The latter is not only found in minute particles, but also frequently in small plates which show the Widmannstadt figures in the form of an extremely fine rectangular network. Here and there are found silver-white crystals of rhabdite, one of the forms of nickelliferous iron. By far, however, the most interesting substance contained in the meteorite, is a form of crystalline elementary carbon, dull black in appearance and of extreme hardness, at least 9. It is, in fact, a variety of black diamond, and its presence in the meteorite affords considerable ground for speculation. Carbon is further present in the form of organic substances soluble in ether, and these substances carbonize upon heating, evolving the usual odour of burning organic matter. Hence this meteorite is an extremely interesting one, and forms another addition to the fast-accumulating list of those in which carbon forms a not insignificant ingredient.

OUR ASTRONOMICAL COLUMN.

OBJECTS FOR THE SPECTROSCOPE.

Sidereal Time at Greenwich at 10 p.m. on March 6 = 8h. 58m. 19s.

Name.	Mag.	Colour.	R. A. 1890.	Decl. 1890.
			h. m. s.	° ' "
(1) G.C. 1713	—	—	8 45 49	+33 56
(2) 120 Schj.	6.5	Reddish-yellow.	9 4 6	+31 26
(3) a Hydræ	—	Yellow.	9 22 12	— 8 14
(4) a Cancr.	3	Yellowish-white.	8 52 30	+12 17
(5) 124 Schj.	4	Reddish-yellow.	9 45 59	+22 36
(6) T Monocerotis ...	Var.	Yellow.	6 19 20	+ 7 87

Remarks.

(1) This bright oval nebula is now in a very convenient position for observation. I am not aware that the spectrum has been recorded. It is about 8' long, and 3' broad, and is thus described in the General Catalogue: "Very bright, very large, very much elongated $40^\circ 9'$, gradually much brighter in the middle." The description is very suggestive of the Great Nebula in Andromeda, and if, as in that case, the spectrum at first appears continuous, closer scrutiny may reveal irregularities. The brighter parts, assuming that they exist, should be compared with the spectrum of carbon.

(2) According to the observations of D'Arrest, Secchi, and Vogel, this is a fine example of the stars of Group II. Dunér states that all the bands 1 to 10 inclusive are excessively wide and dark, and that the spectrum is totally discontinuous. The star, therefore, affords a good opportunity for further observations of the bright carbon flutings with the object of establishing the cometary character of the stars of this group. It may be remarked that the citron band of carbon need not enter into this comparison, as it will be masked by the dark fluting of manganese (band 4).

(3) A star of the solar type (Konkoly). The usual differential observations are required.

(4) A star of Group IV. (Vogel). The usual observations are required.

(5) This star has a "very fine" spectrum of the Group VI. type, notwithstanding its low altitude in our latitude (Dunér). The principal bands, 6, 9, and 10, are very dark, and the secondary bands, 4 and 5, are also well seen. Further observations, with special reference to line or other absorptions, are suggested.

(6) A maximum of this short-period variable will occur on March 8. Gore gives the period as 26.76 days, and the magnitudes at maximum and minimum as 6.2 and 7.6 respectively. There is still a little doubt with regard to its spectrum. In his spectroscopic catalogue, Vogel writes it II.a? III.a, giving the magnitude at the time of observation as 7.3. In all probability the spectrum is intermediate between Group II. and Group III., perhaps something like Aldebaran.

A. FOWLER.

THE TOTAL SOLAR ECLIPSE OF DECEMBER 22, 1889.—M. A. De La Baume Pluvinel, who was located in Royal Island, about 30 miles north of Cayenne, during this eclipse, communicated his results to the Paris Academy on the 17th ult. (*Comptes rendus*, No. 7, 1890). An examination of the photographs of the corona which were obtained leads to the conclusions that—

(1) The corona presented the same general aspect as on January 1, 1889.

(2) The extension of the corona was small, being about 18' at the solar equator, and about 6' at the poles, and in this respect resembled the coronæ of 1867 and 1878, thus confirming the intimate relation that exists between the intensity of extra-solar phenomena and the frequency of sun-spots.

(3) The aspect of the luminous aigrettes which constitute the corona, and notably the curved form of the aigrettes in the neighbourhood of the poles, seem to prove the existence of streams of matter submitted to two forces—a force of projection normal to the solar sphere, and a centrifugal force developed by the sun's rotation.

COMETS AND ASTEROIDS DISCOVERED IN 1889.—

Comet a 1889.—Discovered on January 15, a little before dawn, by Mr. W. Brooks at Geneva, N.Y., U.S.A. The comet was moving rapidly from east to west, and was not afterwards observed.

Comet b 1889.—Discovered by Mr. Barnard, of the Lick Observatory, on March 31; it was then very feeble and difficult to see. After perihelion passage, the comet was observed at Ann Arbor on July 22, near the position assigned to it by M. E. Millosevich.

Comet c 1889.—Also discovered by Mr. Barnard, on June 23, as a faint nebulousity without condensation or tail. Not observed after August 6. Dr. Berberich determined the elements of this comet on the hypothesis of an elliptic orbit, and found that its period was 128 years.

Comet d 1889.—This comet, the most interesting of those observed last year, was discovered by Mr. Brooks, of Geneva, U.S., on July 6. It is periodic, the time of revolution being 7.04 years. On August 1, Mr. Barnard found that the principal comet was accompanied by four companions. Mr. Chandler